

CLAIMS

What is claimed is:

1. A shoe to accept a foot having a heel, arch, metatarsals, and toes, the shoe comprising;
5 a bottom having an expansion mechanism for expanding the bottom laterally underlying the metatarsals;
an upper carried by the bottom; and
a chassis carried by the bottom for underlying the foot.
2. A shoe of claim 1 wherein the expansion mechanism of the bottom includes a
10 crowned shape such that the bottom has a bottom surface wherein a central region of the bottom surface extends below a pair of side edges of the bottom surface when the shoe is in an unloaded state/position and the edges move outward and downward when the shoe is in a loaded state.
3. A shoe of claim 1 wherein the expansion mechanism of the bottom includes an
15 outer sole having a plurality of apertures, the outer sole of the bottom and the upper defining a shoe volume, the bottom including a displacement portion generally overlying the outer sole and filling a portion of the shoe volume, the displacement portion capable of deforming and projecting through the apertures of the sole portion and into channels therein increasing the shoe volume.
- 20 4. A shoe of claim 1 wherein the expansion mechanism of the bottom includes a base portion and an expansion portion, the base portion having a plurality of slots extending generally longitudinally in the mid-foot region defining the

expansion portion, the expansion portion formed of a material allowing lateral expansion of the bottom.

5. A shoe of claim 4 wherein the upper has an expanding and contracting mechanism for expanding and contracting the upper.
- 5 6. A shoe of claim 5 wherein the expanding and contracting mechanism is a flexible material interposed between two pieces of leather at a seam wherein the flexible material expands and contracts.
7. A shoe of claim 5 wherein the expanding and contracting mechanism is an expandable omega seam interposed between two pieces of leather at a seam
10 wherein the omega opens and closes.
8. A shoe of claim 5 wherein the chassis has at least three tailored zones, a heel zone underlying the heel of the foot, a metatarsal zone underlying the metatarsals, and a toe zone underlying the toes of the foot.
9. A shoe of claim 8 wherein the chassis has an additional tailored zone, an arch
15 zone underlying the arch of the foot.
10. A shoe of claim 8 further comprising a waterproof, breathable liner carried in the shoe, the waterproof, breathable liner prevents water from and passing through the liner to the foot and allows the foot to breathe.
11. A shoe of claim 10 wherein the waterproof, breathable liner has an expandable
20 region in the metatarsal and toe zones and non-expandable region in the heel zone.

12. A shoe to accept a foot having a heel, arch, metatarsals, and toes, the shoe comprising;
- 5 a bottom having an expansion mechanism for expanding the bottom laterally underlying the metatarsals;
- an upper carried by the bottom; and
- a chassis carried by the bottom for underlying the foot, the chassis having at least three tailored zones, a heel zone underlying the heel of the foot, a metatarsal zone underlying the metatarsals, and a toe zone underlying the toes of the foot.
- 10 13. A shoe of claim 12 wherein the chassis includes a base layer, a top layer, and an insert, the insert extending between the base layer and the top layer in the heel zone and an arch zone, the insert in the arch zone having a plurality of fingers allowing for flexure.
14. A shoe of claim 13 wherein the chassis has an additional tailored zone, an arch zone underlying the arch of the foot.
- 15 15. A shoe of claim 14 wherein the upper has an expanding and contracting mechanism for expanding and contracting the upper.
16. A shoe of claim 15 wherein the expanding and contracting mechanism is a flexible material interposed between two pieces of leather at a seam wherein the flexible material expands and contracts.
- 20 17. A shoe of claim 15 wherein the expanding and contracting mechanism is an expanding omega seam interposed between two pieces of leather at a seam wherein the omega opens and closes.

18. A shoe of claim 15 wherein the expansion mechanism of the bottom includes a base portion and an expansion portion, the base portion having a plurality of slots extending generally longitudinally in the mid-foot region defining the expansion portion, the expansion portion formed of a material allowing lateral expansion of the bottom.
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19. A shoe of claim 11 wherein the expansion mechanism of the bottom includes a base portion and an expansion portion, the base portion having a plurality of slots extending generally longitudinally in the mid-foot region defining the expansion portion, the expansion portion formed of a material allowing lateral expansion of the bottom.
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20. A shoe of claim 19 wherein the expansion mechanism of the bottom includes expansion mechanisms for expanding the shoe longitudinally.
21. A shoe of claim 20 wherein the longitudinal expansion mechanism includes the base portion having at least a portion of the slots extending generally laterally defining an expansion portion, the expansion portion receiving a material allowing longitudinal expansion of the bottom.
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22. A shoe of claim 19 further comprising a heel cup formed integrally with the chassis and separate from the upper and the bottom.
23. A shoe to accept a foot having a heel, arch, metatarsals, and toes, the shoe comprising;
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- a bottom;
 - an upper carried by the bottom; and

a chassis carried by the bottom for underlying the foot, the chassis having at least three tailored zones, a heel zone underlying the heel of the foot, a metatarsal zone underlying the metatarsals, and a toe zone underlying the toes of the foot.

- 5 24. A shoe of claim 23 wherein the upper has an expanding and contracting mechanism for expanding and contracting the upper.
25. A shoe of claim 24 wherein the bottom further comprises an expansion mechanism for expanding the bottom laterally underlying the metatarsals.
- 10 26. A shoe of claim 25 wherein the upper is secured to the bottom by a securing mechanism underlying the chassis.
27. A shoe of claim 25 wherein the upper is secured to the bottom by a securing mechanism extending generally vertically.
- 15 28. A shoe of claim 25 wherein the bottom further comprises a lip, the upper having a portion that overlies the lip, and further comprising a line of stitching extending through the upper into the lip to define a welt.
29. A shoe of claim 28 wherein the chassis has an additional tailored zone, an arch zone underlying the arch of the foot.
30. A shoe of claim 29 wherein the expansion mechanism of the bottom includes a base portion and an expansion portion, the base portion having a plurality of slots extending generally longitudinally in the mid-foot region defining the
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expansion portion, the expansion portion formed of a material allowing lateral expansion of the bottom.

31. A shoe of claim 30 further comprising a waterproof, breathable liner carried in the shoe, the waterproof, breathable liner having an expandable region in the metatarsal and toe zones and non-expandable region in the heel zone, the waterproof, breathable liner preventing water from passing through the liner to the foot and allowing the foot to breathe.
32. A shoe of claim 31 wherein the expanding and contracting mechanism is an elastic omega seam interposed between two pieces of leather at a seam wherein the omega opens and closes.
33. A shoe to accept a foot having a heel, arch, metatarsals, and toes, the shoe comprising;
- a bottom;
 - an upper carried by the bottom, the upper having an expanding and contracting mechanism for expanding and contracting the upper;
 - a chassis carried by the bottom for underlying the foot; and
 - a waterproof, breathable liner carried in the shoe, the waterproof, breathable liner having an expandable region in the metatarsal and toe zones and non-expandable region in the heel zone, the waterproof, breathable liner preventing water from passing through the liner to the foot and allowing the foot to breathe.
34. A shoe of claim 33 wherein the bottom further comprises an expansion mechanism for expanding the bottom laterally underlying the metatarsals.

35. A shoe of claim 34 wherein the expanding and contracting mechanism is an elastic omega seam interposed between two pieces of leather at a seam wherein the omega opens and closes.
- 5 36. A shoe of claim 35 wherein the expansion mechanism of the bottom includes a base portion and an expansion portion, the base portion having a plurality of slots extending generally longitudinally in the mid-foot region defining the expansion portion, the expansion portion formed of a material allowing lateral expansion of the bottom.
- 10 37. A chassis for underlying a foot having a heel, arch, metatarsals, and toes, the chassis comprising;
the chassis having at least three tailored zones, a heel zone underlying the heel of the foot, a metatarsal zone underlying the metatarsals, and a toe zone underlying the toes of the foot.
- 15 38. A chassis of claim 37 wherein the chassis has an additional tailored zone, an arch zone underlying the arch of the foot.
39. A chassis of claim 38 wherein the chassis has a transition area between at least two of the zones.
- 20 40. A shoe having a forefoot region, a mid-foot region, and a heel region, the shoe comprising;
a bottom having a base portion and an expansion portion, the base portion having a plurality of slots extending generally longitudinally in the mid-foot region defining the expansion portion, the expansion portion formed of a material allowing lateral expansion of the bottom;

an upper portion carried by the bottom portion; and
a chassis carried by the bottom and having a plurality of materials
adapted to the foot for spreading the force .

41. The shoe of claim 40 wherein the bottom portion has a crowned shape such that
5 the center of the bottom surface extends below the edges when the shoe is in an
unloaded state and the edges move outward when the shoe is in a loaded state.
42. The shoe of claim 40 wherein the upper portion has an expanding and
contracting mechanism for stably holding the foot as the foot moves.
43. The shoe of claim 42 wherein the expanding and contracting mechanism is a
10 flexible material interposed between two pieces of material at a seam wherein
the flexible material expands and contracts.
44. The shoe of claim 42 wherein the expanding and contracting mechanism is an
elastic omega seam.
45. The shoe of claim 40 wherein the chassis has a heel cup for supporting the foot.
- 15 46. The shoe of claim 40 wherein the chassis is contoured to the foot.
47. A shoe to accept a foot, the shoe comprising:
a bottom;
an upper carried by the bottom;
a chassis carried by the bottom for underlying the foot; and
20 a waterproof, breathable liner carried inside the bottom and the upper, the
liner having a slip lasted fore part and a cement lasted back part sealed with a

waterproof gasket for preventing water from passing through the liner to the foot and allows the foot to breathe.

48. Foot wear for accepting a foot having a heel, arch, metatarsals, and toes, the footwear comprising a lower portion having an expansion mechanism for expanding the lower portion laterally underlying the metatarsals.
49. The footwear of Claim 48 in which the lower portion includes a bottom having longitudinally extending grooves which are configured to expand laterally when the bottom flexes.
50. The footwear of Claim 49 in which the grooves have longitudinally extending sidewalls, the sidewalls being angled outwardly.
51. The footwear of Claim 48 in which the lower portion includes a bottom having a crowned bottom surface, wherein flattening of the bottom surface laterally expands the bottom.
52. A method of forming a shoe for accepting a foot having a heel, arch, metatarsals, and toes, the method comprising:
- providing a bottom having an expansion mechanism for expanding the bottom laterally underlying the metatarsals;
 - providing an upper carried by the bottom; and
 - providing a chassis carried by the bottom for underlying the foot.
53. A method of forming footwear for accepting a foot having a heel, arch, metatarsals, and toes, the method comprising forming a lower portion having an

expansion mechanism for expanding the lower portion laterally underlying the metatarsals.

54. A method of expanding footwear, the footwear having a bottom for accepting a foot having a heel, arch, metatarsals, and toes, the method comprising:
- 5 allowing the foot to expand; and
- expanding the bottom laterally underlying the metatarsals with an expansion mechanism by exertion of forces by the expanding foot.
55. A method of expanding footwear, the footwear having a lower portion, the method comprising:
- flexing the lower portion during use; and
- 10 expanding the lower portion with an expansion mechanism, the expansion mechanism expanding in response to flexing of the lower portion.
56. The method of Claim 55 in which the lower portion includes a bottom having longitudinally extending grooves, the method further comprising configuring the grooves to expand laterally with flexing of the bottom.
- 15 57. The method of Claim 56 further comprising providing the grooves with longitudinally extending sidewalls that are angled outwardly.
58. The method of Claim 55 further comprising providing the lower portion with a bottom having a crowned bottom surface, wherein flattening of the bottom surface laterally expands the bottom.